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### SPREAD OF THE EUROPEAN STARLING IN NORTH AMERICA

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The European starling (*Sturnus vulgaris*) is firmly established in the eastern part of the United States. Most people look upon the bird with suspicion as an alien and have viewed with considerable alarm its rapid spread in recent years, remembering the disastrous effects which have frequently resulted from the introduction of other foreign species into the fauna of a country. Such importations now are prohibited by law (Lacey Act, May 25, 1900), and no foreign wild birds or animals can be brought into the United States except under permit issued by the Secretary of Agriculture.

The starling has become thoroughly acclimatized in this country, and because of its recent rapid spread it has seemed desirable to trace and record the stages of its advance while it is possible to gather the information.<sup>1</sup> For this purpose circulars were recently sent to bird-migration observers cooperating with the Biological Survey, and to other ornithologists living in the territory surrounding that in which the starling was known to be abundant, requesting information regarding the presence, date of first arrival, and present status of the species. The data thus obtained supplement information resulting from similar circulars sent out in 1915.

#### ORIGINAL INTRODUCTION AND ESTABLISHMENT

Several attempts have been made to introduce the starling into this country, but no records are at hand to show how many or for

<sup>1</sup> In 1915, E. H. Forbush published an account of the species in this country, showing its status at that time. The Starling, Mass. State Board of Agriculture, Circular 45, 23 pp., 1915.

what purpose.<sup>2</sup> The earliest effort of which we have any knowledge was in Cincinnati, Ohio, in the winter of 1872-73, when several birds were released, but nothing further was heard of them or of several subsequent importations. In May, 1889, 20 pairs of European starlings were released in Portland, Oreg., but the colony did not thrive. Pairs were found nesting in that city until about 1900, but the species has not been heard of there since about that time.

Eighty birds were released in Central Park, New York City, in April, 1890, and 40 more in March of the next year. These two importations mark the permanent establishment of the species in North America. From New York it has spread east to the Penobscot River, Me., north to the Ottawa River, Canada, west to central Ohio, and south to Georgia and Alabama, though in the greater part of this territory it is still of only local or accidental occurrence. This spread has been irregular rather than along evenly advancing lines.

About 10 years following their successful introduction were required for the establishment of starlings about New York City, after which they began to spread rapidly. At various times new centers have been formed from which the adjacent country has been colonized just as from the original colony, and these new colonies usually coincide with centers of human population.

The starling is a prolific species, raising usually two broods of three to six young a year, and its rapid increase in numbers required constant reaching out for new food supplies and new breeding places. The species once firmly established, its spread, due to its increasing numbers, steadily continued, and wandering flocks appeared in various localities at the same time, as though scouting for new abiding places.

### METHODS OF SPREAD

Starlings are natural vagrants, and food and weather conditions are probably additional factors influencing their wanderings, the latter, especially in winter, driving them south, where many of the first records were obtained after a storm or during very cold weather. The species is quite susceptible to cold, and in a cold winter the birds may be driven to points far beyond the breeding range. In this connection it is worthy of note that in a majority of places the first appearance of starlings has been during winter or early spring. In some localities they are only accidental visitors for several years after their first appearance, in others they breed the first season and then disappear, or they may immediately settle down as residents.

In addition to increase in numbers, much of the spread of the European starling has resulted from the tendency of small flocks to wander. Many, if not most, of the outlying occurrences are probably due to the habit which these birds have of gathering in large flocks and roosts after the breeding season. In these roosts, especially those in marshes, starlings become associated with red-winged blackbirds

<sup>2</sup> The Chinese starling (*Aethiopsar cristatellus*) has become established in the city of Vancouver, B. C. Nothing is known regarding its introduction. Two pairs were noted in 1897, and in 1920 it was estimated that 1,200 occupied one main roost. No attempt has been made at this time to trace the spread of this species, but it should be noted that one bird, evidently from this colony, was seen in February, 1922, at Portland, Oreg. It is possible that in time it may extend its range over much of the Pacific coast region.



and cowbirds, and when these latter migrate, some of the starlings apparently continue the association and, under the guidance of these companions, move on to new fields of exploration and conquest. Many of the outlying records are of birds seen in company with redwings or cowbirds, either in flocks or roosts.

The starling seems to prefer the vicinity of water and, at least in New England, is most abundant near the coast and in the lowlands of the river valleys. This preference has had a marked influence on the dispersal of the species. Albany, N. Y., on the Hudson, and Greenfield, Mass., on the Connecticut, were reached before localities inland in western Connecticut. Philadelphia was reached probably by way of the Passaic, Raritan, and Millstone Rivers to the Delaware Valley. The route to western New York was apparently by way of the Hudson and Mohawk River valleys and the lake region.

#### EXTENSION OF RANGE

Following the introductions of 1890 and 1891 the species increased steadily, but during the first six years was not known to breed outside the limits of Greater New York. By 1900 its spread had extended only up the Hudson River to Ossining, N. Y., along the shore of Long Island Sound to Norwalk, Conn., and inland to Plainfield, N. J. While the bird was still confined to this small area, the Federal Lacey Act prohibited its further importation or its transportation from one State to another within the United States, but the starling had already gained a sufficient foothold to insure its spread.

The next six years saw the range extended to the Connecticut River and up this as far as Hartford; up the Hudson to Newburgh, and south and west as far as Princeton, N. J. An isolated pair had bred in 1904 at Trevese, Pa., and wandering flocks had reached Philadelphia.

The birds had become well established about Philadelphia by 1910 and were moving on into adjacent territory as they had spread about New York 20 years earlier. At this time they were locally distributed over much of northern New Jersey as far south as Burlington and Vincentown, and had been taken at Cape May. They had moved up the Hudson Valley to Rhinebeck, where they were found breeding that year, and up the Connecticut Valley to Amherst, Mass. Along the Sound shore they had reached Mystic and New London, Conn., and one or two pairs had been found breeding in the vicinity of Providence, R. I.

The year 1916 saw the limits of the territory occupied by starlings greatly extended, well beyond their previous limits. Their range then included practically the entire State of Massachusetts (the vicinity of Boston having been reached in 1913), the southern corner of Maine, to and including Portland; the southern border of New Hampshire; and the Connecticut Valley to Bellows Falls and Woodstock, Vt. The greatest gain, however, was westward. From Albany, N. Y., which had been reached in 1911, the birds had worked westward along the Mohawk Valley and through the lake region of central New York, and in 1916 they occurred in several localities as far west as Lake Cayuga and were found breeding at Ithaca. In Pennsylvania, Wayne County was reached, and birds were reported west to Center County. A specimen taken at West Lafayette, Ohio, in January, 1916, marks the first appearance of the species

west of the Allegheny Mountains. In the same year at least one pair nested near Washington, D. C., the first breeding record for the vicinity, though individuals had first reached that locality in January, 1912, and flocks had been present every winter since.

Another marked extension of range occurred in 1922, when the limits were extended to include Waterville and Burnham, Me., Concord, N. H., the Connecticut Valley at least as far as Woodsville, N. H., all of New York State except the mountains and the extreme northern part, and Pennsylvania, Maryland, and Virginia, locally. In 1921 starlings bred in at least four localities in Ohio and in West Virginia. At Spartanburg, S. C., one pair bred in 1922 and several in 1923, the most southerly record of breeding to date.

The Canadian border was first crossed by the starling in the winter of 1919, when a small flock was noted at St. Catharines, Ontario. Since then birds, singly or in flocks, have been noted at several points in southern Ontario as far west as Wheatley, about opposite their westernmost record in Ohio. In 1923 a pair was found breeding at Port Dover, on Lake Erie. In the spring of 1922 several starlings were noted about Ottawa, but up to January, 1924, had not been known to nest in that vicinity. That same spring they crossed into southern Quebec, and in 1923 two or three pairs bred near Hatley, about 50 miles north of the international boundary, and two pairs nested near Montreal, the most northerly record of breeding to date. A flock of seven was reported late in January, 1924, as apparently wintering at the latter place.

Starlings have been reported from many localities well beyond the farthest limits of the territory that could at present be considered their breeding range. Bangor, Me., and Montreal and Ottawa, Canada, at present mark the limits of their occurrence to the east and north. To the south, a single specimen was taken at Savannah, Ga., in the fall of 1917, and a small flock was noted about the city on several occasions in the winter of 1922-23; at Amelia Island, Fla., one was taken January 24, 1918; while at Montgomery, Ala., a single bird was picked up after a severe northeast storm in January, 1918, and a large flock was seen in January, 1920. The southwestern limit of the starling's occurrence is the Mississippi River about 25 miles above Baton Rouge, La., where in December, 1921, a small flock was noted regularly in the same locality for several weeks. These are at present the only records for the Gulf States and indicate a jumping over of considerable territory. During the winter of 1920-21 a flock of about 500 birds spent more than two months near Nashville, Tenn., in a roost with cowbirds. A flock of seven or eight was seen several times during January and February, 1922, at Urbana, Ill., again with grackles and cowbirds. In February and March, 1923, two specimens were taken at Milwaukee, Wis., and in October of that year two were taken at Knoxville, Tenn.<sup>3</sup>

#### PRESENT EXTENT OF RANGE (1924)

Although the present range (January, 1924<sup>3</sup>) may be considered to extend from central Maine to central Ohio and from southern Canada to northern South Carolina, throughout much of this territory the

<sup>3</sup> Since the manuscript of this circular was prepared the following additional records have been received: Athens, Ga., 5 seen and 1 collected, March 7, 1924; Thomasville, Ga., a flock of about 30 seen during the spring of 1924; Lake Jackson, Leon County, Fla., 4 seen November 9, 1924; Detroit, Mich., 2 seen in May, 1924; Ann Arbor, Mich., several seen and one collected in September, 1924; and Vicksburg, Mich., one found dead December 15, 1924. Starlings have also been found in several additional localities in Ohio.

starling is still of only local occurrence. Probably the area indicated on the accompanying map (fig. 1) by the line of 1914 would include practically all the territory where the starling is now sufficiently

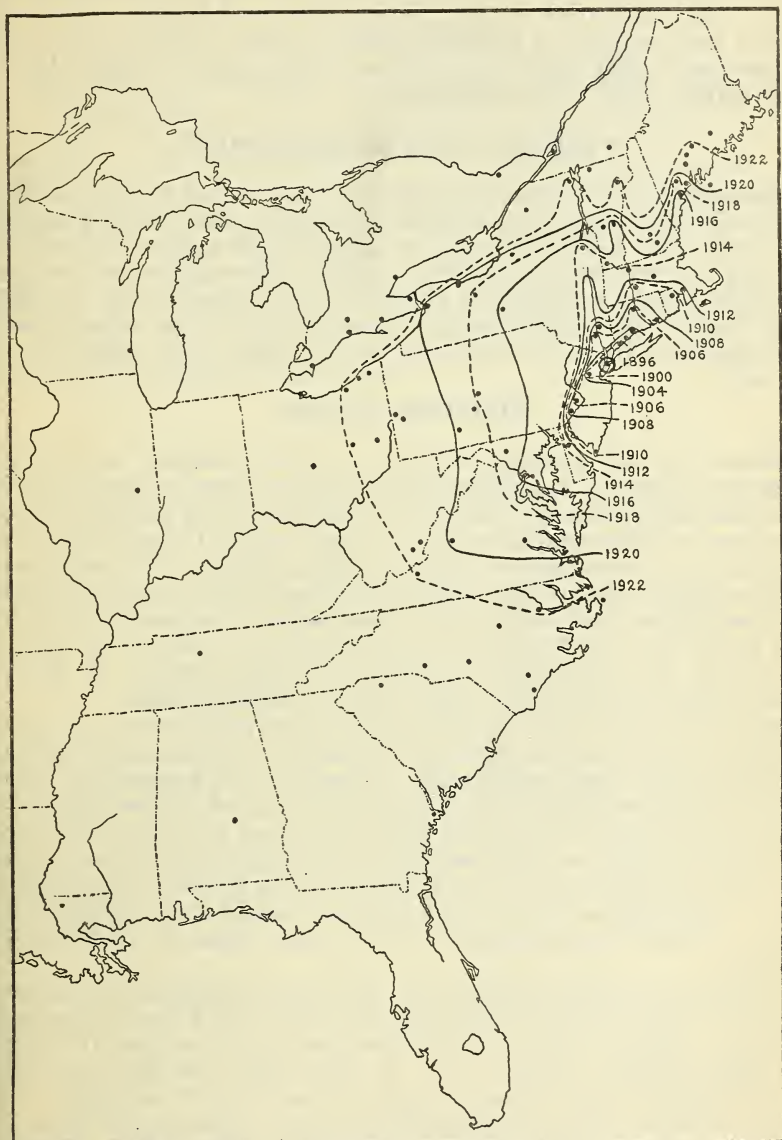


FIG. 1.—Breeding range of the European starling in eastern North America. Areas successively covered in two-year periods shown by alternating broken and continuous lines. Spots outside the 1922 line indicate isolated records, mainly in winter, details of which are given in the text.

abundant to be of economic importance, and even within this area there are many localities where the species is still unknown. Throughout most of southern New England, southern New York,



northern New Jersey, and eastern Pennsylvania it is an abundant species, in some places outnumbering the English sparrow. In this region the birds seem to be permanently resident.

The status of the species in the rest of its range may be described by its characterization in the British Isles by Clarke<sup>4</sup> as "a resident, a local migrant, a summer visitor, a winter visitor, and a bird of passage." Any one or all of these terms may be applicable to these erratic birds in a single locality.

### PROBABLE FUTURE EXTENSIONS

The barrier of the mountains having been crossed by the starling, all the Central States will in time be occupied, but it will probably be many years before the species becomes sufficiently numerous in these States to be of economic importance. How much it will extend its range on to the plains is a question, for it seems hardly probable that it will find much territory there suitable to its requirements. The northern limit of the range may already have been nearly reached.

### ECONOMIC STATUS

Because of the growing abundance of the starling and the increasing number of complaints from various sources concerning its activities, the Biological Survey, in 1916, carried on extensive investigations to determine its economic status in the United States and published a comprehensive report on the findings.<sup>5</sup> These investigations showed that in this country the species has not yet developed the destructive food habits that characterize it in parts of Europe and Australia, and that it is a good citizen so far as its food is concerned. Its undesirable qualities arise from choice of nesting sites, relations with native birds, and the flocking habit.

Starlings nest in holes in trees and in any available crevices about buildings, and thus the filthiness caused by the presence of their nests may make them undesirable. They are of a pugnacious disposition and drive other birds from the vicinity of houses, especially such birds as bluebirds and flickers, which nest in holes or in boxes provided for their use. Experiment has demonstrated, however, that the starling can not enter a hole less than 1½ inches in diameter, so that it is possible to protect some species of native birds by providing boxes with holes large enough for them but a little too small for the starling.<sup>6</sup>

Whether or not the starling will cause any decrease in the numbers of native birds is still an open question, though it may cause some species to disappear from about homes (except where special feeding for native birds is carried on). Its food habits, in some cases, are more beneficial than those of many of the birds it supplants. In places, however, where feeding stands are maintained starlings are liable to consume all the food provided for other birds. Popular antagonism to the foreigner often is based on a partiality for our native species, rather than on purely economic grounds.

<sup>4</sup> Clarke, William Eagle. *Studies in Bird Migration*, vol. 1, p. 252, London, 1912.

<sup>5</sup> Kalmbach, E. R., and I. N. Gabrielson. *Economic Value of the Starling in the United States*: U. S. Dept. Agriculture, Bul. 868, 66 pp., 4 pls. 3 figs. 1921.

<sup>6</sup> See *Farmers' Bulletin No. 609, Bird Houses and How to Build Them*.



The greatest danger from the starling seems to be from its habit of gathering into large flocks. While a few individuals may be harmless or even beneficial, the immense flocks that gather after the breeding season constitute a potentiality for harm.

#### CONCLUSION

After 20 years of unsuccessful attempts at introduction, the European starling became firmly established in New York City in 1890. and now, definitely occupying its place in this country, must be considered a naturalized member of the American bird fauna. In less than 35 years it has become one of the most abundant birds in the region contiguous to New York City, and of local occurrence from central Maine to central Ohio, and from Ottawa and Montreal, Canada, to Georgia and Alabama. Thus far the species has not been found to be as seriously destructive to crops in the United States as it is reported to be in some parts of the Old World. Nevertheless, it is probable that many people will always look with unfavorable eyes upon the starling as an alien.

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December 2, 1924

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